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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/710,472	11/10/2000	Masato Sugimoto	10873.600US01	5701

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EXAMINER
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GONZALEZ, JULIO C

ART UNIT	PAPER NUMBER
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2834

DATE MAILED: 12/03/2001

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/710,472

Applicant(s)

SUGIMOTO ET AL.

Examiner

Julio C. Gonzalez

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 17 September 2001.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Kasanami et al.

Kasanami et al discloses a piezoelectric element comprising a piezoelectric substrate, a pair of electrodes on a principal plane and second principal plane where shear vibration is nonparallel to a side wall of the piezoelectric substrate (see figure 21). Also, the piezoelectric element has the shape of an elongated rectangular solid (see figure 41).

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kasanami et al in view of Yanagihara et al.

Kasanami et al discloses a piezoelectric element comprising a piezoelectric substrate, a pair of electrodes on a principal plane and second principal plane where shear vibration

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is nonparallel to a side wall of the piezoelectric substrate (see figure 21). Also, the piezoelectric element has the shape of an elongated rectangular solid (see figure 41). However, Kasanami et al does not disclose that the piezoelectric element is composed of a certain crystal.

On the other hand, Yanagihara et al discloses for the purpose of decreasing undesired response waveform and suppressing the ripple within a certain frequency band, that the piezoelectric substrate is made of  $\text{LiTaO}_3$  (column 1, lines 29).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to design a piezoelectric element with two planes as disclosed by Kasanami et al and to make the piezoelectric material using lithium tantalate for the purpose of decreasing undesired response waveform and suppressing the ripple within a certain frequency band as disclosed by Yanagihara et al.

5. Claims 9 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kasanami et al in view Mandai et al.

Kasanami et al discloses a piezoelectric element comprising a piezoelectric substrate, a pair of electrodes on a principal plane and second principal plane where shear vibration is nonparallel to a side wall of the piezoelectric substrate (see figure 21). Also, the piezoelectric element has the shape of an elongated rectangular solid (see figure 41). However, Kasanami et al does not disclose the use of a ground electrode and that the piezoelectric element can be used for a mobile device.

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On the other hand, Mandai et al discloses for the purpose of ensuring a predetermined and a resonant frequency and providing means for easily adjusting the frequency that a ground electrode is used in the device, and that the piezoelectric element is cut using a laser (column 2, line 25).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to design a piezoelectric element with two planes as disclosed by Kasanami et al and to use a ground electrode for the purpose of ensuring a predetermined and a resonant frequency and providing means for easily adjusting the frequency as disclosed by Mandai et al.

6. Claims 4,5,10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kasanami et al in view of Yanagihara et al and Mandai et al and ordinary skill in the art.

Kasanami et al discloses a piezoelectric element comprising a piezoelectric substrate, a pair of electrodes on a principal plane and second principal plane where shear vibration is nonparallel to a side wall of the piezoelectric substrate (see figure 21). Also, the piezoelectric element has the shape of an elongated rectangular solid (see figure 41). However, Kasanami et al does not disclose that the piezoelectric element is composed of a certain crystal.

On the other hand, Yanagihara et al discloses for the purpose of decreasing undesired response waveform and suppressing the ripple within a certain frequency band, that the piezoelectric substrate is made of  $\text{LiTaO}_3$  (column 1, lines 29).

However neither Yanagihara et al or Kasanami et al disclose the use of a ground electrode and that the piezoelectric element can be used for a mobile device.

On the other hand,, Mandai et al discloses for the purpose of ensuring a predetermined and a resonant frequency and providing means for easily adjusting the frequency that a ground electrode is used in the device, and that the piezoelectric element is cut using a laser (column 2, line 25).

Kasanami, Yanagihara and Mandai disclose the claimed invention except for the rotation of the planes. It would have been an obvious matter of design choice to make the planes rotate in the XY and YZ direction, since applicant has not disclosed that the rotation of the planes solve any stated problem or is for any particular purpose and it appears that the invention would perform equally well with any other rotation.

7. Claims 6-8 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kasanami et al in view of Yanagihara et al and Mandai et al, ordinary skill in the art and Hermann.

Kasanami et al discloses a piezoelectric element comprising a piezoelectric substrate, a pair of electrodes on a principal plane and second principal plane where shear vibration is nonparallel to a side wall of the piezoelectric substrate (see figure 21). Also, the piezoelectric element has the shape of an elongated rectangular solid (see figure 41). However, Kasanami et al does not disclose that the piezoelectric element is composed of a certain crystal.

On the other hand, Yanagihara et al discloses for the purpose of decreasing undesired response waveform and suppressing the ripple within a certain frequency band, that the piezoelectric substrate is made of  $\text{LiTaO}_3$  (column 1, lines 29).

However neither Yanagihara et al or Kasanami et al disclose the use of a ground electrode and that the piezoelectric element can be used for a mobile device.

On the other hand, Mandai et al discloses for the purpose of ensuring a predetermined and a resonant frequency and providing means for easily adjusting the frequency that a ground electrode is used in the device, and that the piezoelectric element is cut using a laser (column 2, line 25).

However, neither Kasanami, Yanagihara or Mandai disclose the ratio of the width versus thickness of the piezoelectric element.

On the other hand, Hermann discloses for the purpose of providing a strong piezoelectric element and not to have a critical dependency on thermal characteristics that the width to thickness ratio is between 1.5 and 5 (column 1, lines 55-58).

Kasanami, Yanagihara, Mandai and Hermann disclose the claimed invention except for the rotation of the planes. It would have been an obvious matter of design choice to make the planes rotate in the XY and YZ direction, since applicant has not disclosed that the rotation of the planes solve any stated problem or is for any particular purpose and it appears that the invention would perform equally well with any other rotation. Also, it would have been obvious to one having ordinary skill in the art at the time the invention was made to design a piezoelectric element with two planes as disclosed by Kasanami et al and to make the piezoelectric material using lithium tantalate for the

purpose of decreasing undesired response waveform and suppressing the ripple within a certain frequency band as disclosed by Yanagihara et al and to use a ground electrode for the purpose of ensuring a predetermined and a resonant frequency and providing means for easily adjusting the frequency as disclosed by Mandai et al and to use a certain width to thickness ratio for the purpose of providing a strong piezoelectric element and not to have a critical dependency on thermal characteristics as disclosed by Hermann.

***Response to Arguments***

8. Applicant's arguments filed 9/17/01 have been fully considered but they are not persuasive.

According to Merriam-Webster's Collegiate Dictionary, shear means to cut with something sharp, to move along the plane of contact, to become divided, etc. According to claim 1, shear vibration is not defined in any way and could be interpreted with as many definitions as the dictionary could give. Moreover, as disclosed in the claims, a pair of electrodes formed on at least one principal plane and electrodes are formed along the width of the substrate, Kasanami et al discloses a piezoelectric 18a with electrodes 22a, 20a formed on a principal plane and electrodes formed along the width of the vibrator 10 (see figure 19). Now figures 20 and 21 are a modified example of the embodiment shown (column 3, lines 30-32). The claims do not define specifically the first and second principal plane or the traverse direction. From the claims, any plane with electrodes reads on the claims disclosed. Also, the claims do not mention if the electrodes are or are not covering the entire piezoelectric layer.



9. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., Thickness shear vibration is generated by applying a voltage to electrodes formed on the first principal plane and the second principal plane of the piezoelectric substrate. The vibration direction therefore is vertical to the thickness direction of the substrate and the end portions of the electrodes. The use of a piezoelectric element utilizing a thickness shear vibration mode is directed to a configuration for suppressing unnecessary spurious vibration) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

### **Conclusion**

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

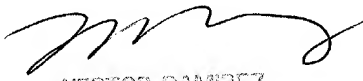
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julio C. Gonzalez whose telephone number is (703) 305-1563. The examiner can normally be reached on M-F (8AM-5PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor Ramirez can be reached on (703) 308-1371. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 305-1341 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

  
NESTOR RAMIREZ  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2000

Jcg

November 21, 2001